SCIENCE, AERONAUTICS AND TECHNOLOGY
FISCAL YEAR 1998 ESTIMATES
BUDGET SUMMARY

OFFICE OF AERONAUTICS AND SPACE TRANSPORTATION TECHNOLOGY

SUMMARY OF RESOURCES REQUIREMENTS

AERONAUTICS AND SPACE TRANSPORTATION TECHNOLOGY	FY 1996	FY 1997	FY 1998
Aeronautical research and technology	865,900	844,200	920,100
Advanced space transportation technology	234,000	336,700	396,600
Commercial technology programs	170,200	158,600	152,800
Total	**1,270,100**	**1,339,500**	**1,469,500**

PROGRAM GOALS

The goal of the Aeronautics and Space Transportation Technology Enterprise is to conduct enabling, risk reducing research with focused technology demonstrations, through industry led cooperative partnerships, which will result in the near term application of high-payoff, and critical technologies that support the efficient accomplishment of NASA mission requirements while also leading to improvement of U.S. economic competitiveness. These technologies have the potential to dramatically reduce the cost of access to space and provide for safer, more environmentally responsible, and economically superior U.S. civil and military aircraft and space launch systems, as well as improve operation of the national airspace system. The cooperative nature of these research efforts and technology demonstrations not only allows for the research funding burden to be shared with private industry, but also increases the effective transfer of research and technology products and results to private industry and other Federal agencies in order to further support increased U.S. economic competitiveness.

STRATEGY FOR ACHIEVING GOALS

NASA carries out its aeronautics and space transportation technology mission in close partnership with U.S. industry, academia and other Federal agencies such as, the DOD and the FAA.

Aeronautics

The design of the aeronautics portion of the program reflects the continued need to address critical aeronautical safety, environmental, airspace productivity, and aircraft performance needs and to strengthen technology development in selected high-payoff areas vital to the Nation's long-term leadership in aviation. NASA's aeronautics program is focused around six strategic thrusts:

- Develop high-payoff technologies for a new generation of environmentally compatible, economic U.S. subsonic aircraft and a safe, highly productive global air transportation system;
- Ready the technology base for an economically viable and environmentally friendly high-speed civil transport;
- Ready the technology options for new capabilities in High Performance aircraft;
- Develop and demonstrate technologies for airbreathing hypersonic flight;
- Develop advanced concepts, physical understanding, and theoretical, experimental, and computational tools to enable advanced aerospace systems; and
- Develop, maintain, and operate critical national facilities for aeronautical research and for support of industry, the FAA, DOD, and other NASA programs.

To achieve these aeronautics goals, the Aeronautics and Space Transportation Technology Enterprise will increase customer review of program planning and execution; emphasize the use of low-cost experimental aircraft to increase flight opportunities; and reduce and rationalize infrastructure via centralized facility management, the designation of Centers of Excellence, and national alliance activities. The Center of Excellence concept will serve to focus the in-house research program, provide single points-of-contact for management and external customers, and ensure maximum cost effectiveness.

Space Transportation

The design of the space transportation technology program reflects the requirement for focused efforts to develop and demonstrate pre-competitive next generation technology that will enable the commercial launch industry to provide truly affordable and reliable access to space early in the 21st century. In addition, NASA will continue to support DOD (the lead agency) for improvements to existing expendable launch vehicles in areas where NASA's unique facilities and expertise can help government and industry. Consistent with the National Space Transportation Policy, NASA, as a member of the national team, will develop technology for the next generation space transportation system, with a target of reducing launch vehicle development and operations costs dramatically after the year 2000. The Reusable Launch Vehicle (RLV) program utilizes innovative, industry led cooperative agreements to accomplish technology development research and conduct the technology demonstrations necessary to

prove the feasibility of the enabling technologies that will lead to significant reductions in launch vehicle development and operations costs. Improvements to operations costs resulting from this program may also be applicable to expendable launch vehicles. The Advanced Space Transportation program focuses on development of those technologies which have the potential to reduce launch and operations costs beyond the ambitious RLV goals as well as technology required to address other strategic objectives not related to the RLV program.

By aggressively working through cooperative agreements with private industry to reduce the cost of access to space, NASA expects to make considerable headway in achieving a vital space program that meets the needs of the nation while consuming fewer resources and yet also increases the global competitiveness of the U.S. space launch industry. Due to the recent merger of the aeronautics and space technology programs into one management group, NASA is examining possible technological synergies between ongoing aeronautics and space transportation program efforts. Similarities in research requirements between programs for high temperature materials for structures and propulsion, aerodynamics and flight control may lead to opportunities for a shared return on technology research in these areas.

Commercial Technology

The third major program area of the Aeronautics and Space Transportation Technology Enterprise is the commercial technology program, also recently transferred from the former Office of Space Access and Technology. Since it's inception in 1958, NASA has been charged with ensuring that NASA-developed technology is transferred to the U.S. industrial community to improve the competitive position of the U.S. in the world community. The scope of the commercialization effort encompasses all NASA technologies created at NASA centers by civil servants as well as innovations from NASA contractors. The technology commercialization program consists of conducting a continuous inventory of newly developed NASA technologies, maintaining a searchable database of this inventory, assessing the commercial value of each technology, disseminating knowledge of these NASA technology opportunities to the private sector, and supporting an efficient system for licensing NASA technologies to private companies. In addition, NASA commercialization efforts also include the operation of the Small Business Innovation Research program, which is designed to enhance NASA's use of small business technology innovators and lead to increased commercialization of NASA technology with small firms.

MEASURES OF PERFORMANCE

Where feasible, all major programs within the Aeronautics and Space Transportation Technology Enterprise use clearly defined and measurable milestones to track program performance against the program plan. Major program milestones are customer negotiated and approved product and service deliverables that are identified in formal program plans. Progress against these milestones serves as a critical metric for program performance evaluation. In

addition, specific quantitative or qualitative evaluation criteria have been defined as critical program performance metrics for each milestone to enable a determination of successful milestone achievement. These measures of overall program performance measure both effectiveness and efficiency relative to program plan technical, schedule and resource requirements.

To measure the Aeronautics and Space Transportation Technology Enterprise, its programs, and the manner in which they are conducted, the Enterprise has developed -- and is continually refining -- a "family" of performance metrics that cover the following:

- Specific Program Performance: Measures of program performance, both effectiveness and efficiency, relative to program plan technical, schedule and resource requirements.

Metric: Deliverables completed as a percentage of planned deliverables.

- Customer Satisfaction: Measures of customer satisfaction with respect to Enterprise products and services.

Metric: Triennial survey of customers on a wide range of issues, including overall customer satisfaction. The goal for

FY 1998 is a 100% customer rating of 5 or above and a 50% rating at 8 or above on a 10 point scale.

Metric: Facility Utilization Satisfaction exit interview survey. The current goal is 100% customer rating of 5 or above and a 80% rating at 8 or above on a 10 point scale.

- Other Organizational Goals and Processes: Measures of performance relative to other key multi-programmatic or non-programmatic policies and goals. A specific goal is to increase cooperative programs with the Aerospace community.

Metric: Ten percent of the dollar value of the total aeronautics R&D program involved in cooperative activities.

- Overall Program Outcome: Measures of the long-term impact of the Aeronautics and Space Transportation Technology program on its customers and the nation as a whole.

Metric: Identify specific examples of products and services used by customers and the impact of those products and services.